

18-642:

Course Information

Fall 2021

<http://www.ece.cmu.edu/~ece642/>
ece642-staff@lists.andrew.cmu.edu



@PhilKoopman

■ Embedded software engineering concepts

- Practical code quality
- Practical, industry-strength embedded SW engineering process
- Embedded System Safety, Embedded-specific Security
- Generally, things industry wants that most grads don't know

■ Hands-on practice at applying concepts

- Software project material; small but high quality code
- Emphasis on improving software, not clean-sheet design

■ Learn how to think about embedded systems

- Homework & discussions to encourage critical thinking

■ **NON-Goals** (things that are not course goals):

- There is no embedded hardware platform (take an embedded microcontroller course)
- Not about specific software technology; especially not about Android/iOS/Embedded Linux/...
- Not about wireless networking, sensor networks, etc.
- **Not about hacking crazy-complicated code**



https://commons.wikimedia.org/wiki/File:CMU_Hamerschlag_Hall.jpg

■ Lectures + Quizzes

- Recorded video (mostly 10-25 min)
- Canvas quiz at end

■ Homeworks

- Usually create one or two slides
- Some short presentation videos
- Check-off grading

■ Group work (usually 1 per week)

- Joint assignments
- Peer reviews of project code
- Check-off grading

■ Live weekly class meeting

- Discussion, review
- Attendance taken (see policies)

■ Projects

- Individual software assignments
 - Programming
 - Industry software practices
- Emphasizes code quality
- Cumulative work

■ Weekly Status survey

- Course hours, your questions

In-Class Participation

■ Attendance is required

- Make a point of attending the live class session
 - Attendance taken at every meeting
- If you have an excused conflict, instructor in office hours *before next class* will count
- Poor attendance will affect your grade

■ You'll make short homework presentations

- Mixture of live vs. pre-recorded
- Typical presentation is 60 – 90 seconds long
 - Concentrate on briefly getting the important points across

■ These are low-stakes presentations

- Preparation is not expected beyond being able to talk about your own assignment
- Emphasis on good faith participation, not perfection
- Expectation is adequate English & improvement over semester (English not graded)

<https://www.flickr.com/photos/xverges/3092873536>



■ Mostly code modification & other hands-on activities

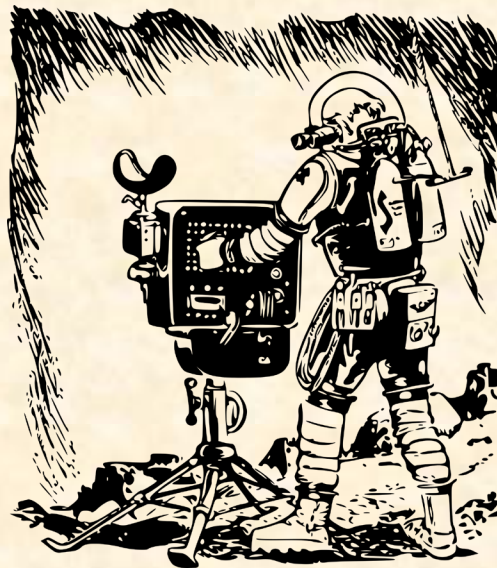
- Some non-trivial programming
- Emphasis is on code quality
- C++, but emphasis is on plain C in general
- Light use of Robot Operating System (ROS)
- Group peer reviews in later project phases

■ Projects build upon each other

- Slacking off early will hurt you later

■ Significant increase in project difficulty at project #5

- You have been warned!



<https://openclipart.org/detail/3020/space-pioneers-135>

Course Information & Syllabus

■ Main course content – web site

- <http://www.ece.cmu.edu/~ece642/>
- Read the Policies page
- Read the FAQ page
- Points to lecture slides, assignments

■ Canvas – assignments

- Pay attention to Canvas announcements
- Hand-in for all assignments
 - Canvas deadline is the official deadline
- Lecture & project videos are in the assignment description
- Used for recording grade info

Fall 2021 Lecture Date	Lect. #	Lecture Slides For reference	Video Lectures Due on Wednesday night; (AV lectures due Sunday night)	Homeworks Due on Following Monday Night	Group Exercise Due on Following Tuesday Night	Project Due on Following Friday Night
Monday 30-Aug- 2021		Classes Start	Project 1 intro video is playable on Canvas assignment page.			Proj #1 (Startup) Due Fri 3- Sep-2021
Thursday 2-Sep- 2021 Week 1	1	Course Topics Overview	Embedded Software Code Quality, Safety, Security (44 min)	HW #01 Self Intro (DUE Wed 1- Sep-2021)		Proj #2 (Initial Cleanup) Due Fri 10- Sep-2021
	2	Admin Info	Course Overview & Administrative Matters (Video on Canvas only) (40 min)	HW #02 Computer Safety Literacy Stories; slide & video (DUE Tue 7- Sep-2021)		
	100	(No slides)	AV: Look Who's Driving (54 min) (PBS Nova)			
	Live:	Discuss: Q&A on course policy & content	Discuss: Self-intro Part 1 (HW #1)	Fill out weekly survey after class each week.		
Mon 6-Sep		Labor Day No office hours				
9-Sep Week 2	3	SW Process	SW Process (49 min)	HW #03		Proj #3 (Code Style) Due 17-Sep- 2021
	4	Code Style for Humans	Code Style for Humans (15 min)	HW #04		
	5	Code Style for Compilers	Code Style for Compilers (21 min)			
	6	Peer Reviews	Peer Reviews (33 min)		GP #06 Peer Review Exercise	
	Live:	Guest: TBD	Finish Self-Intro/ Peer Review Exercise	Discuss: HW #2 (failure stories)		

Course Grade

- Typical class medians: Lectures 99% / Project 97%
- But, you have to put in the work to get the grade!

Grade	Lecture Quizzes (graded)	Homework (check-off)	Group Assignments (check-off)	Project (graded)	Weekly Status (check-off)	Attendance
A	All Completed; ≥95% average; Maximum 4 late	All completed; Maximum 3 late	Maximum 1 not completed	≥90% average; All project assignments completed Passes all final acceptance tests 1 late penalty forgiven	All completed	Miss at most 1 week
B	All Completed; ≥85% average; Maximum 8 late	Maximum 1 not completed (*) <u>plus</u> Maximum 3 late	Maximum 2 not completed	≥80% average; All project assignments completed; Passes majority of final acceptant tests 1 late penalty forgiven	All completed	Miss at most 2 weeks
C	All Completed; ≥75% average	Maximum 3 not completed (*); No maximum late	Maximum 3 not completed	≥70% average; All project assignments completed; Might not pass acceptance tests 1 late penalty forgiven	All completed	Miss at most 3 weeks

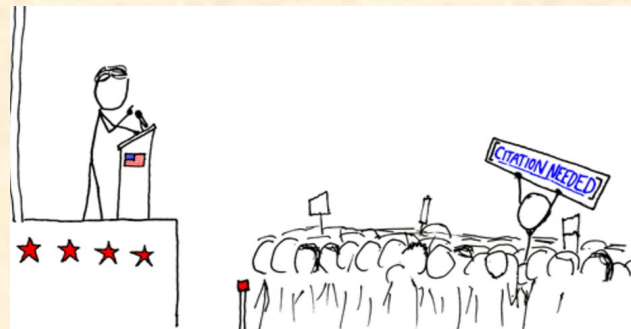
Academic Integrity Overview

■ Zero-tolerance policy for cheating

- **Failure in course for first offense of cheating**
- Yes, we are serious
- Per CMU policy, both giver and receiver equally guilty

■ What's not cheating?

- Asking course staff for help
- Using an acceptable resource and citing it (e.g., give us the URL)
 - See next slide for “acceptable resource”
 - OK: materials on the course web page/course Canvas account with no citation
- Asking your friends for help with background activities
 - Understanding what the lecture was saying
 - Understanding *what* the assignment wants you to do (not how to do it; not the answer)
 - Help with getting tools, infrastructure, and so on running
 - » But not doing things for you if doing that thing is a project assignment



https://en.wikipedia.org/wiki/Randall_Munroe#/media/File:Webcomic_xkcd_-_Wikipedian_protester.png

Academic Integrity: Acceptable Sources

■ Published/WWW material is OK if ALL of following are met:

1. You make substantive changes or addition
 - *Changes demonstrate mastery of material*, not just cosmetic/superficial changes
 - Reword and summarize what you find in your own words and give a citation.
 - **Not OK:** simply changing variable names and line ordering on code you got somewhere
 - **Not OK:** block quote copy & pasted from a source unless that is what we asked for
 - » OK: pasting a news photo or news article in response to “show us a news article”
2. Sources are not connected to or responsive to this course
 - OK: blog posting that describes a general technique
 - **Not OK:** solutions for 18-642 at a “study guide” or help site
3. It's not Wikipedia or similar non-authoritative source
 - Wikipedia is OK for informal orientation, but is not a citeable source unless we say OK
 - OK: It's fine to use Wikipedia references as a *starting point*
 - **Not OK:** fraudulent citation, including using Wikipedia summary instead of primary source

Academic Integrity: Concrete Examples

- **Not OK:** On-line 18-642 “study aid” resources as a starting point
- **Not OK:** Someone else’s solution as a starting point, even if you change it
- **Not OK:** Working with a group on homeworks/projects unless we say to
 - Homework questions generally graded on “good try”; often there is no single right answer
 - OK: study group about concepts *before you start* your homework; before-test study groups
 - OK: study group discussion after *all participants* have handed in, and do not revise
- **Not OK:** Accepting step-by-step instructions from another student
 - Especially bad if this is done verbally to skirt “copying” rules
 - Do not “launder” help by talking as a group to a TA while exchanging peer information
- **Not OK:** Attendance fraud, signing in for another student, etc.
- **Not OK:** Quiz cheating
 - Any help from anyone to complete a lecture quiz
 - (Note: you get unlimited chances to try the quiz)

- E-mail to: ece642-staff@lists.andrew.cmu.edu
 - E-mail direct to instructor or TA might not be read
 - Only e-mail administrative issues, not substantive technical questions/"doubts"/etc.
 - Go to office hours for help understanding course content, homework, project
 - OK to e-mail about infrastructure problems so we can fix them
- Please be on time to class. We won't wait for stragglers.
- No distracting noises
 - No noisy/messy/smelly food. NO potato chips, crinkly bags/wrappers.
 - Clean up after yourself -- leave classroom clean
 - On-line meetings: [mute microphone unless you're speaking](#)
- Mobile devices must not intrude on classroom
 - In general, only use electronics directly in support of the class activity
- No recording, photo, screen capture, live-tweeting, etc. of the classroom
 - Course materials (e.g., handouts) are copyright by instructor; no redistribution
- See CMU Academic Integrity policy: <https://www.cmu.edu/academic-integrity/>



https://commons.wikimedia.org/wiki/File:Alice_par_John_Tenniel_02.png

Special Circumstances & Wellness

- If you have a special need, let us know the first week of class
- If we're doing something that's a problem let us know
 - Anonymous e-mail is fine if you prefer
 - Asking staff advisor to tell us is fine if you prefer
- If you're experiencing a problem, let us know
 - You might be surprised about the ways we can help
 - Come to us sooner, not later
 - Not much we can do in last week of class
- If in doubt, ask us
 - Especially regarding academic integrity policy
 - Honest mistakes can be corrected if you're honestly acting in good faith



<https://pixabay.com/en/cold-ill-fever-thermometer-1972619/>

The “I Wish You Had Told Me” Slide

- This is an all-remote course, with one live meeting per week.
 - Class is NOT recorded. Be there in person every single week.
 - We expect you to be live on camera during class with few exceptions
- There are two cumulative review homeworks
 - One slide per lecture. Good idea to do these as you do lectures
 - Treat these seriously. They are instead of a mid term + final exam.
- Check announcements daily
 - We expect you to read each Canvas announcement entirely
 - (If we take the time to write it, it is important that you read it.)
- Later projects take more time than early projects
 - Early projects give first-semester students time to adjust to CMU workload
 - If you are new to Unix and shell scripts, watch the suggested tutorials early

Course Staff Contact:

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